

CLIMATE AND HEALTH IN THE SOUTH AMERICAN TROPICS.¹

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I can only very briefly give expression to my views concerning the climatic conditions of northern South America in their relation to health and mortality. The general public is accustomed to regard the Tropics as having an unhealthy "climate," without a clear grasp of what the term climate really implies. Writers on tropical explorations make much of heat and humidity without clearly emphasizing the conditions under which disagreeable experiences were had. Wholly false impressions prevail regarding the so-called climate of the immense Amazonian Basin, as to which, as yet, few instrumental observations exist, while most of the conclusions of even scientific observers are little less than vague generalizations. Hence much if not most of what has been written on the tropical climate of northern South America is seriously misleading and a deterrent to the settlement of a vast region which is one of enormous economic possibilities for the future.

There are no reasons whatever why a so-called tropical climate should be *per se* an unhealthy one. Tropical heat, of course, gives rise to tropical parasitical life with its resulting evil pathogenic effects upon the human organism. But such diseases as result indirectly from tropical heat and moisture can now be effectively guarded against by the intelligent observance of ordinary rules of living. Northern climates require safeguarding against extreme cold, while southern climates rarely require safeguarding against extreme heat. It is true that the climate is warm throughout the larger portion of the year, but the warmth is usually limited to the daytime, while the nights are cool and often distressingly so. The chief causes of ill health and premature death in northern South America are not tropical diseases but respiratory and rheumatic affections, which prevail to an enormous extent among the native population. The sensible temperature at night is at times extremely trying and guarded against only by an abundance of covering, which is usually wanting in the case of the native population. Houses are poorly constructed and the draughts during the night chill the body to a point where disease resistance reaches its lowest ebb. Coughs and colds are of practically universal occurrence and no precautions are employed on the part of the natives, who are improperly fed, improperly clothed, and improperly housed. The resulting high mortality is not chargeable to the climate, but to apathy and indifference and colossal ignorance.

It is regrettable that there should be such a paucity of instrumental observations, particularly for the nighttime. The admirable climatological records of the Madeira-Mamore Railway, for illustration, are only for the daytime and limited to four readings, respectively, at 6:30 a. m., 11 a. m., 3 p. m., and 6:30 p. m. But in my own experience the most trying period is between 2 and 3 o'clock in the morning, when the temperature may be 30° lower, and even more, than in the daytime. The instrumental records of the Madeira-Mamore Railway, as provided by the Engineering Department, are, however, of great value in that they extend over the entire period of construction from 1907 to the present day. It is to be hoped that this material will sometime be made avail-

able to students of the South American climate, while at the same time expression may be given to the hope that the records may be extended to include automatic observations during the night. While it is always warm during the day, it is rarely excessively hot. In my analysis of the tropical mortality of northern South America I failed to meet with a single case of sunstroke or thermic fever. Such cases occur, but generally in the remote sections and among men indifferent to weather conditions and employed at possibly exhausting toil. Personally, I never suffered the slightest inconvenience from high temperatures, while, as I have said before, I suffered distressing results of low temperatures during the night.

There are likewise widespread erroneous views concerning the humidity, which, in settled localities, is far from being as serious a detriment to health and comfort as is generally assumed to be the case. In the forest, of course, the humidity is high, and in the morning clothing, etc., will be found thoroughly saturated unless protected by adequate rubber covering, but in settled sections, like Porto Velho, Riberalta, or Manaós, the humidity is of quite secondary sanitary importance. As I have shown in my report to the English-Speaking Conference on Infant Welfare at London, England, on the climatic conditions of York and Homestead, Pa., with reference to infant mortality, the death rate from diarrheal diseases reaches excessive proportions when a high humidity coincides with a high temperature.² It should not be difficult to determine the precise point of danger, which, if known, could be effectively guarded against as one of the most important steps toward the saving of infant life. Likewise tropical climates can be guarded against by rational adaptation to local conditions, and I may conclude by saying that in my own case during seven months I never suffered an hour of serious illness from any cause whatsoever.

It would be interesting to have careful instrumental observations made on daily weather changes in the Tropics and their physiological effects on bodily conditions. One certainly feels the changes from warmth to cold much more in the Tropics than in the north, and changing in my own case from Para with a temperature of 80° to Toronto with a temperature near to zero, I can not but feel that such changes when properly safeguarded against are of very slight, if any, importance in their bearing upon health and longevity.

I regret that my own instrumental observations were materially interfered with by unsuitable or defective instruments, breakage, etc., as well as inexperience. But I feel strongly, as a result of my investigations, that the difficulties in the Tropics as regards health are not essentially climatic, but concerned with food, clothing, housing, and habits, all of which are subject to intelligent and rational human control. In brief, in the light of my experience I can not but feel that the climate of northern South America has been grossly maligned by those who, in a spirit of reckless adventure, disregarded known safety precautions, while on the contrary white residents observing accepted principles of personal hygiene enjoy good health and suffer in but a minimum degree from the so-called tropical diseases.